

THE INVENTION CLAIMED IS:

1. In a scanning electron microscope comprising:
 - an electron gun for producing an electron beam;
 - an objective lens for sharply focusing the electron beam onto a specimen;
 - specimen tilting means for tilting the specimen relative to the electron beam;
 - a power supply for applying a negative voltage to the specimen;
 - the improvement comprising:
 - a cylindrical shield electrode for surrounding an electron beam path between the objective lens and the specimen, the shield electrode having a front-end portion on its specimen side; and
 - a front-end electrode insulatively mounted on the front-end portion of said shield electrode,
 - wherein an electric potential substantially identical to an electric potential at polepieces of the objective lens is applied to said shield electrode, and
 - wherein an electric potential substantially identical to an electric potential at the specimen is applied to said front-end electrode.
2. The improvement of claim 1, wherein there is further provided a retracting mechanism for retracting said shield electrode from the electron beam path.
3. The improvement of claim 1, wherein there is further provided moving means for moving said shield electrode along the electron beam path.
4. The improvement of claim 3, wherein said shield electrode is mounted so as to be receivable within the objective lens.
5. The improvement of claim 3 or 4, wherein there is further provided first control means for controlling said moving means in such a way that said shield electrode is moved upward along the electron beam path as the specimen is tilted more by said specimen tilting means.
6. The improvement of claim 3 or 4, wherein there is provided specimen-elevating means for varying the distance between the specimen and the objective lens, and wherein there is further provided second control means for controlling said moving means to

maintain constant the distance between the specimen and the shield electrode regardless of variation of the distance between the specimen and the objective lens made by said specimen-elevating means.

7. A method for controlling a scanning electron microscope having an electron gun for producing an electron beam, an objective lens for sharply focusing the beam onto a specimen, specimen tilting means for tilting the specimen relative to the electron beam, a power supply for applying a negative potential to the specimen, a cylindrical shield electrode for surrounding an electron beam path between the objective lens and the specimen, the shield electrode having a front-end portion on its specimen side, and a front-end electrode insulatively mounted to said front-end portion of the shield electrode, said method comprising the steps of:

applying an electric potential substantially identical to an electric potential at polepieces of said objective lens to said shield electrode; and

applying an electric potential substantially identical to an electric potential at said specimen to said front-end electrode.

8. The method of claim 7, wherein said shield electrode is moved upward along the electron beam path as the specimen is tilted more by said specimen tilting means.

9. The method of claim 7, wherein the distance between said specimen and said shield electrode is maintained constant regardless of variation of the distance between said specimen and said objective lens.